3.12 Cultural Resources and Paleontological Resources

Cultural resources include prehistoric archaeological sites, historic archaeological sites, traditional cultural properties, and historic structures. *Paleontological resources* are resources in the fossil record, such as prehistoric remains and other evidence of past life. This section discusses the applicable federal and state laws and regulations that protect cultural and paleontological resources, including Section 106 of the National Historic Preservation Act (NHPA) and California Public Resources Code Sections 5024.1 and 21084.1, and assesses the potential for the proposed HST system to have impacts on these resources[1].

3.12.1 Regulatory Requirements and Methods of Evaluation

A. REGULATORY REQUIREMENTS

Cultural Resources

The NHPA (16 USC § 470 *et seq.*) established a national program to preserve the country's historical and cultural resources. Section 106 of the NHPA requires federal agencies to consider the effects of their actions on historic properties and provide the President's Advisory Council on Historic Preservation an opportunity to comment on a proposed action before it is implemented. Regulations for implementing the Section 106 process are provided in 36 CFR § 800. Both state and federal guidelines for cultural resources recognize that buildings, structures, objects, districts, and cultural landscapes can be historically significant. The NHPA refers to these significant resources as *historic properties*, while under CEQA, such highly sensitive resources are referred to as *historical resources*. Under NHPA Section 106 (36 CFR § 800.16), a historic property is "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places [NRHP]." Districts include the property types known as cultural landscapes (historic, rural, designed, etc.). To be eligible for the NRHP, these property types must meet at least one of the NRHP significance evaluation criteria (36 CFR § 60.4) to be considered a historic property, and the property must also possess integrity. NRHP historic properties meet one or more of the following evaluation criteria:

- The property is associated with events that have made a significant contribution to the broad patterns of our history (Criterion A).
- The property is associated with the lives of persons significant in our past (Criterion B).
- The property embodies the distinctive characteristics of a type, period, or method of construction; represents the work of a master; possesses high artistic values; or represents a significant and distinguishable entity whose components may lack individual distinction (Criterion C).
- The property has yielded, or may be likely to yield, information important to prehistory or history (Criterion D).

Under CEQA, significant cultural resources are called *historical resources* whether they are of historic or prehistoric age. *Historical resources* are resources that are listed, or eligible for listing, in the California Register of Historical Resources (CRHR), or which are listed in the historical register of a local jurisdiction (county or city). NRHP historic properties located in California are considered historical resources for the purposes of CEQA and are also listed in the CRHR (PRC § 5024.1). Generally, a resource should be considered a historical resource for the purposes of CEQA if it has integrity and meets one or more of the criteria for listing in the CRHR (CEQA Guidelines §

[1] See Section 3.0, Introduction, for an explanation of how this section fits together with the HST Network Alternatives presented in Chapter 7, as well as for an overview of the information presented in the other chapters.

15064.5[a][3]). These state criteria are based on, and are very similar to, federal significance criteria:

- The resource is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage (Criterion 1).
- The resource is associated with the lives of persons important in California's past (Criterion 2).
- The resource embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual; or possesses high artistic values (Criterion 3).
- The resource has yielded, or may be likely to yield, information important in prehistory or history (Criterion 4).

The NRHP and CRHR criteria are almost identical. Any resource determined eligible for NRHP is also automatically eligible for CRHR. However, the term historical resources under CEQA and CRHR is more inclusive because resources listed in local historical surveys that meet Office of Historic Preservation standards are encompassed.

Adverse changes to historic properties and historical resources caused by an undertaking are described as *adverse effects* under Section 106, and as *adverse changes* or *adverse impacts* under CEQA. The definition of *effect* for the purposes of Section 106 of NHPA is contained within 36 CFR § 800.16 (i): "*Effect* means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register." An *adverse effect* occurs "when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.... Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative."[2] Examples of adverse effects may include, but are not limited to, destruction, damage, alteration, or relocation of a historic property, as well as the introduction of elements that diminish the property's integrity, cause neglect of a property, or its transfer out of federal ownership.[3]

Impacts on historical resources listed in or eligible for the CRHR constitute a significant effect on the environment (significant impacts that must be disclosed in a CEQA environmental document) if the impact constitutes a substantial adverse change in the significance of a historical resource (PRC § 21084.1). Similar to the federal definition of adverse effect, a *substantial adverse change* to a historical resource under CEQA includes "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines § 15064.5[b][1]). *Material impairment* includes changes to the physical characteristics that make a historical resource eligible for listing in the CRHR such that the resource would no longer be eligible for the CRHR or a local historical register (CEQA Guidelines § 15064.5[b][2]).

Paleontological Resources

The following United States statutes incorporate provisions for the protection of paleontological resources.

[2] 36 CFR 800.5(a)(1).

[3] 36 CFR 800.5(a)(2)(i through vii).

- Federal Antiquities Act of 1906 (16 USC § 431 *et seq.*): Establishes national monuments and preservation of lands that have historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal lands. Section 433 prohibits appropriation, excavation, injury, or destruction of any historic or prehistoric ruin or monument, or any object of antiquity on federal lands only.
- National Environmental Policy Act of 1969 (P.L. 91–190, 83 Stat. 852, 42 USC §§ 4321–4327): Mandates policies to "preserve important historic, cultural, and natural aspects of our national heritage" (§ 101.b4).

In California, fossil resources are considered a limited, nonrenewable, highly sensitive scientific resource. The following state statutes incorporate provisions for the protection of paleontological resources.

- CEQA (PRC § 21000 *et seq.*): Requires public agencies and private interests to identify the potential adverse impacts and/or environmental consequences of their proposed project(s) to any object or site that is historically or archaeologically significant or significant in the cultural or scientific annals of California (PRC § 5020.1). Under CEQA, archaeological resources are presumed nonunique unless they meet the definition of *unique archaeological resources* (PRC § 21083.2[g]). Under CEQA, an impact on a nonunique archaeological resource is not considered a significant environmental impact. An EIR need not discuss nonunique archaeological resources.
- CEQA Guidelines (14 C.C.R. § 15064.5 [a][3]): Provides that a lead agency may find that "any object, building, structure, site, area, place, record, or manuscript" is historically significant or significant in the "cultural annals of California." The section also provides that, generally, a resource may be considered historically significant if it has yielded or may be likely to yield information important in prehistory. Paleontological resources fall within this broad category and are included in the CEQA checklist under cultural resources.
- Public Resources Code Section 5097.5: Prohibits excavation or removal of any "vertebrate paleontological site…or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands." *Public lands* include lands owned by or under the jurisdiction of the state of California or any city, county, district, authority, or public corporation, or any agency thereof. This section provides that any unauthorized disturbance or removal of paleontologic, archaeological, and/or historic materials or sites located on public lands is a misdemeanor.
- Public Resources Code Section 30244: Requires reasonable mitigation of adverse impacts on paleontological resources resulting from development on public land in the coastal zone, as defined in Public Resources Code Section 30103.

B. METHOD OF EVALUATION OF IMPACTS TO CULTURAL RESOURCES

Archaeological Sites and Traditional Cultural Properties

As part of the Authority's and FRA's statewide HST Program EIR/EIS document (November 2005), the FRA initiated consultation with the State Historic Preservation Office (SHPO) under Section 106 of the NHPA in November 2002. SHPO concurred with a phased identification effort for historic properties as provided for in 36 CFR § 800.4 (b)(2). The phased identification effort would continue for this Program EIR/EIS. As with the statewide HST Program EIR/EIS, the area of potential effects (APE) for this undertaking was defined as 500 ft on either side of the HST Alignment Alternatives centerline in non-urban areas and 100 ft from the centerline in urban areas. Where stations or other HST facilities are proposed, the APE was 500 ft around the facility.

Cultural resources studies began with records searches obtained from the appropriate California Historical Resources Information System (CHRIS) Information Centers. The records searches

identified the general locations of previously recorded archaeological sites in the APE. The number of known archaeological sites within the APE for each alternative was tabulated and used as an indicator of potential sensitivity for the comparison of the relative degree of potential impacts or effects for each alternative. For this program-level analysis, individual archaeological sites were not evaluated for eligibility. Instead, the archaeological sites identified as a result of the records searches were considered potentially eligible for listing in the CRHR or the NRHP, and the number of archaeological sites per linear mile identified in the APE for each alternative was used as an indicator of the relative degree of potential impacts on cultural resources from construction or operation of that alternative. Impacts on NRHP-eligible archaeological resources include physical destruction or damage. The total number of archaeological sites in the APE for the corridor was divided by the total length of the alignment alternative being evaluated to arrive at an average number of sites (or proportion of sites) per mile. That average was then translated to a qualitative rating of *low*, *medium*, and *high* impacts as follows.

- Low: 0.00–0.25 site per mile for the corridor.
- Medium: 0.26–0.75 site per mile.
- High: 0.76 or more sites per mile.

The cultural resource specialist's knowledge and background of regional prehistory supplemented the records search results. For example, if the cultural resource specialist had previous knowledge that several sites have been identified along a particular river drainage in the region, but the records search did not yield formally recorded sites in CHRIS within the APE for a particular alignment alternative, the cultural resource specialist documented the additional information and, based on it, increased the rating for that corridor. In addition to the records search, previous studies prepared for the statewide Program EIR/EIS were utilized and included the *Sacramento to Bakersfield, Cultural Resources Technical Evaluation* (Applied Earthworks 2004) and the *Bay Area to Merced, Cultural Resources, Archeology, Technical Evaluation* (Far Western Anthropological Research Group 2004).

Contemporary Native Americans often regard certain types of prehistoric sites and certain types of material sites as especially sensitive. These include habitation sites, shell mounds, and burials. If sites with these characteristics are present along an alignment alternative, that alignment alternative was automatically ranked high for archaeological resources, indicating that the potential sensitivity to impacts from construction disturbance would be greater in that corridor than in a corridor ranked as low or medium.

If the potential project impacts for each alignment alternative could not be differentiated after examining the average number of sites per linear mile (e.g. all corridors have the same rating), each alignment alternative was ranked qualitatively from highest to lowest impact, based on the total number of sites, number of human burial sites, number of habitation sites, and/or any additional documented findings from the cultural resource specialist.

The FRA and the Authority initiated consultation with the California Native American Heritage Commission (NAHC) and requested a search of their Sacred Lands file as part of the Statewide Program EIR/EIS to identify any traditional cultural properties that could be potentially impacted or affected by the project, and requested lists of Native Americans to contact for the areas that could be affected by the project, as required by 36 CFR § 800.4(1)(4). Information on traditional cultural properties would be more readily available during the project-level stage of environmental review during formal consultation when specific project locations and impact information can be shared.

As part of the statewide Program EIR/EIS, letters were sent to Native Americans on the contact lists provided by the NAHC. The letters provided information about the proposed project alternatives and requested information about any archaeological sites, traditional cultural properties, or sacred sites

that could be affected by the project. Subsequently, as part of this Program EIR/EIS, Authority staff contacted tribal representatives to discuss the HST Alignment Alternatives under consideration for the Bay Area to Central Valley.

Historic-era Properties and Historical Resources

The SHPO was also consulted regarding the phased identification effort used in the statewide Program EIR/EIS for evaluating potential effects and impacts to historic-era properties and historical resources.

The method used to predict potential effects and impacts of the HST program on historic properties and historical resources is based upon estimating the amount of historic development that occurred along each proposed alignment alternative and the records search discussed above. These estimates were based upon review of existing documentation, including historical maps, aerial photographs, and local inventories, and the preparers' knowledge of the history of the region. New surveys of historic-period properties/resources were not conducted for this program-level analysis. Instead, the likelihood that a proposed HST route would affect or impact historic properties or historical resources was determined by estimating the linear miles of each alignment alternative that pass through historic development, i.e., buildings, structures, objects, sites, district, and/or landscapes that developed during specific historical time periods (before 1900, 1900 to 1929, and 1930 to 1958). The more area along each HST Alignment Alternative that developed historically, the more likely it is that there would be historic-era properties/historical resources along the route that could be affected or impacted by the HST program. If an alignment alternative traversed an area that was developed fifty or more years ago, there is a high possibility for numerous unrecorded architectural resources to be present within and/or immediately adjacent to the APE. This would result in a higher sensitivity rating as well. In addition to the records search, previous studies prepared for the statewide Program EIR/EIS were utilized and included the *Sacramento to Bakersfield, Cultural Resources Technical Evaluation* (Applied Earthworks 2004) and the *Bay Area to Merced, Cultural Resources: Historic Architecture Technical Evaluation* (JRP Historical Consulting Services 2004).

Paleontological Resources

Paleontological resources determined to be significant are fossils or assemblages of fossils that are unique, unusual, rare, uncommon, and diagnostically or stratigraphically (layers of the earth's surface) important, as well as those that add to an existing body of knowledge in specific areas—stratigraphically, taxonomically, and/or regionally.

The paleontological resources analysis is based on review of USGS (2006a) geologic maps and the *Bay Area to Merced Segment Paleontologic Resources Technical Evaluation* (Parsons 2004) and *Sacramento to Bakersfield Paleontologic Resources Technical Evaluation* (EIP Associates 2004). Literature research and institutional records searches or geologic maps and geographic data from the University of California Museum of Paleontology in Berkeley have resulted in the designation of areas along the HST Alignment Alternatives as having high or low paleontologic sensitivity, as follows.

- High: Sedimentary units with a high potential for containing significant nonrenewable paleontological resources. In these cases, the sedimentary rock unit contains a high density of recorded vertebrate fossil sites, has produced vertebrate fossil remains within the study area and/or vicinity, and is likely to yield additional remains within the study area.
- Low: The rock unit contains no or very low density of recorded resource localities, has produced little or no fossil remains within the study area and/or vicinity, and is not likely to yield any remains within the study area.

The number of rock units (formations) having high paleontologic sensitivity and the number of paleontological resource localities recorded within each study area were assessed to provide an

interpretation of the overall ranking of high, medium, or low potential to impact paleontological resources. This evaluation was reached based on the likelihood of these rock units to contain paleontological resources. Taking the length of alignment segments into consideration and the paleontological sensitivity of those segments, a low overall ranking was determined for the alignment alternative if a majority has a low sensitivity. A medium overall ranking was determined if an alignment alternative has both low and high sensitivity equally. A high overall ranking was determined if a majority of the alignment alternative has a high sensitivity.

C. CEQA SIGNIFICANCE CRITERIA

Under CEQA, a project may have a significant impact on cultural resources if it would:

- Cause a substantial adverse change in the significance of a historical or archaeological resource.
- Directly or indirectly destroy a unique geologic feature or unique paleontological resource or site.
- Disturb any human remains, including those interred outside of formal cemeteries.

CEQA guidelines use the following definitions to analyze impacts on historical or archaeological resources:

- *Substantial adverse change* in the significance of a historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired (CEQA Guidelines Section 15064.5[b][1]).
- The significance of a historical resource would be *materially impaired* when a project demolishes or materially alters in an adverse manner those physical characteristics that convey its historic significance or justify its eligibility for inclusion in or eligibility for the NRHP, CRHR, or local registers. (CEQA Guidelines Section 15064.5[b][2][A–C]).

3.12.2 Affected Environment

A. STUDY AREA DEFINED

The study area for cultural resources is the APE as noted above. The APE for cultural resources at this program level of analysis was developed based on review of the records searches from the CHRIS Information Centers, as well as the cultural resource specialists' knowledge and experience in regional history and prehistory. It is important to note that the APE was specifically designed to aid in the program-level analysis, which provides a general comparison of the alternatives without new identification surveys. The size and width of the APE was selected to predict the existence and relative sensitivity of cultural resources in and near the proposed program alignment alternatives, including prehistoric archaeological sites; historic archaeological sites; traditional cultural properties; and historic buildings, structures, objects, districts, and cultural landscapes. The APE for cultural resources for the proposed HST alignment alternatives is as follows:

- 500 ft (152 m) on each side of the centerline of proposed new rail routes where additional right-of-way could be needed.
- 100 ft (30 m) on each side of the centerline for routes along existing highways and railroads where very little additional right-of-way would be needed.
- 500 ft (152 m) around station locations.

Locations of easements and construction-related facilities, such as equipment staging areas, borrow and disposal areas, access roads, and utilities, have not yet been identified. Locations for these would be identified as part of the construction design program for the alignment alternatives selected

for more detailed analysis in the next phase of the project. Therefore, these items are not considered in the program-level (also known as Tier-1) analysis, but this information would be available for project-level (also known as Tier-2) site-specific EIR/EISs. The APE would be modified to include these items as part of the project-level analysis.

The study area for paleontological resources under the HSR alignment alternatives is 100 ft (30 m) on each side of the centerline of proposed rail routes (including station locations), in both nonurban and urban areas. The study area for paleontological resources is limited to the area that would potentially be disturbed by earthwork construction activities.

B. CULTURAL RESOURCE CATEGORIES

The following topics are covered in this section.

- Prehistoric archaeological sites.
- Historic archaeological sites.
- Historic-era properties and historical resources.
- Traditional cultural properties.
- Paleontological resources.

Following are brief descriptions of each cultural resource category.

Prehistoric Archaeological Sites

Prehistoric archaeological sites in California are places where Native Americans lived or carried out activities during the prehistoric period before 1769 AD. Prehistoric sites contain artifacts and subsistence remains, and they may contain human burials. Artifacts are objects made by people and include tools (such as projectile points, scrapers, and grinding implements), waste products from making flaked stone tools (debitage), and nonutilitarian artifacts (beads, ornaments, ceremonial items, and rock art). Subsistence remains include the inedible portions of foods, such as animal bone and shell, and edible parts that were lost and not consumed, such as charred seeds.

Historic Archaeological Sites

Historic archaeological sites in California are places where human activities were carried out during the historic period between 1769 AD and 50 years ago. Some of these sites may be the result of Native American activities during the historic period, but most are the result of Spanish, Mexican, Asian, African-American, or Anglo-American activities. Most historic archaeological sites are places where houses formerly existed and contain ceramic, metal, and glass refuse resulting from the transport, preparation, and consumption of food. Such sites can also contain house foundations and structural remnants, such as windowpane glass, lumber, and nails. Historical archaeological sites can also be nonresidential, resulting from ranching, farming, industrial, and other activities.

Historic-era Properties / Historical Resources

Historic-era properties (NRHP) and *historical resources* (CRHR) are historically significant elements of the built environment that are listed in or eligible for the NRHP and/or the CRHR. These elements reflect important aspects of local, state, and/or national history and can be buildings, structures, objects, sites, districts, and/or historic cultural landscapes. Examples of the types of historic-era properties or historical resources that are located in and near the APE for the HST program include dwellings, industrial buildings, commercial buildings, downtown districts, farms, canals, rural landscapes, dams, bridges, roads, and other facilities that were built, operated, and previously gained historical significance.

Traditional Cultural Properties

Traditional cultural properties are places associated with the cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community. Examples include locations "associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world" and locations "where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice" (Parker and King 1990).

Paleontological Resources

Paleontological resources are the fossilized remains of animals and plants. They are typically found in sedimentary rock units, and they provide information about the evolution of life on earth over the past 500 million years or more.

Cultural resources within the Bay Area to Central Valley region are discussed below.

Archaeological Resources

As described above, information on the numbers, kinds, and locations of archaeological sites for this Program EIR/EIS was obtained from CHRIS Information Centers. For the most part, the data from CHRIS Information Centers provide cultural resources information only for areas that have been previously surveyed by archaeologists. No archaeological field surveys were conducted for this Program EIR/EIS. However, surveys would be a part of the next stage of environmental review in the project-level EIR/EIS (see Section 3.12-6, *Mitigation Strategies and CEQA Significance Conclusions*).

The study area includes central California from the San Francisco Bay Area (San Francisco and Oakland) south to the Santa Clara Valley and east across the Diablo Range to the Central Valley. The Central Valley portion of the APE spans from Stockton in the north to Madera County in the south.

Archaeological evidence places prehistoric people in California as early as 8,000 to 12,000 years ago; however, the last 2,000 to 4,000 years are best documented. The regional chronological sequence of time periods (PaleoIndian; Early, Middle, and Late Archaic; and Protohistoric) reflects changes in land use that were influenced by population growth (e.g., shift from small camps to village sites), technological innovation (e.g., shift from use of the spear to bow and arrow), and resource intensification (e.g., the intensive use of mortars and pestles and bedrock milling features for acorn processing). Change also resulted from population movements and displacements and from outside influences such as climatic changes. Environmental change and population increase are the two primary factors that have been identified as causal factors in prehistoric culture change.

The records search for the project APE identified 131 archaeological sites, including prehistoric and historic sites. There were 367 architectural resources with most occurring in urban areas. Several of the prehistoric sites are habitation sites—variously referred to as shell mounds, shell middens, and large flaked and ground stone scatters[4] with midden[5] accumulations but also including sites where house pits were noted. Many of these habitation sites (the shell mounds around San Francisco Bay in particular) contain Native American burials. Burials are noted on some of the site records within the APE. Other types of sites identified in the APE include bedrock mortars, lithic scatters, ground stone scatters, and fire-affected rock scatters. The historic archaeological sites identified within the APE

[4] *Ground stone scatter* refers to a site containing milling equipment, including handstones, mortars, and pestles.

[5] *Midden* refers to a mound or deposit containing shells, animal bones, and other refuse that indicates the site of a human settlement.

include debris and features associated with nineteenth and early twentieth-century housing developments, farm complexes, industrial activities, and the San Francisco earthquake of 1906. The first location of Mission Santa Clara de Asís, near the Santa Clara train station, has both prehistoric and historic components.

Historic-era Properties and Historical Resources

Historic buildings in and near the program route alternatives date from the eighteenth century to the twentieth century, although the vast majority date to the early twentieth century. These properties/resources were constructed during the major historic periods of California history, including the exploration and settlement of the Spanish and Mexican eras; the US-Mexican War, the Gold Rush, and statehood in the mid-nineteenth century; and subsequent settlement and development of California through the mid-twentieth century. The property types also vary widely, but most are dwellings, commercial buildings, or industrial facilities that date to the 1890s and after. Properties/resources dating to before 1890 largely consist of a few remaining adobe structures and sites dating to the Mexican period prior to 1848 and wood-frame dwellings and commercial buildings from the period between 1849 and 1890.

The oldest standing elements of the built environment in California date to the eighteenth century, during the period when California was a Spanish colony. Spanish exploration and settlement began in 1769 with the Portola Expedition and continued with the establishment of 21 missions and several presidios (forts) and pueblos (towns) near the coast between San Diego and Sonoma. One of the missions, Santa Clara, is located near the proposed project alignment alternative. The first location of Mission Santa Clara de Asís is an archaeological site with both prehistoric and historic components. It lies near an HST alignment alternative. (See Chapter 2, "Alternatives," for maps of the routes).

The Spanish made land grants to retired soldiers and other Spanish citizens interested in settling the area. The Mexican government continued the land grant system after gaining independence from Spain in 1821 and dissolving the mission system in 1834. The presidios and pueblos founded during the Spanish/Mexican period, including San Francisco, San Jose, Los Angeles, and San Diego, grew slowly during the 1830s and 1840s, and relatively few properties/resources are predicted for the HST routes that pass through these cities.

The United States acquired California upon the ratification of the Treaty of Guadalupe-Hidalgo at the close of the Mexican War in 1848. The subsequent gold rush of 1849 lured immigrants to the west coast from across the United States and around the world. California became a state in 1850, and it continued to grow in population as completion of the transcontinental railroad in 1869 brought more settlers. New towns developed across the state in the nineteenth century but were especially clustered along the state's railroad routes. Some of these properties/historical resources (such as dwellings, businesses, factories, and other buildings and structures from the Victorian era) remain along the various HST Alignment Alternatives.

The early twentieth century saw continued urban expansion in both northern and southern California, especially in conjunction with the first widespread use of automobiles. Popular residential architectural styles during this period included the Craftsman bungalow, the Spanish Colonial Revival, and other revival styles. The increasing use of automobiles also led to construction of linear commercial strips and other roadside development along arterials, although industry and major shipping facilities largely remained clustered along rail lines and maritime ports. By the late 1930s and during World War II, dwellings, commercial, industrial, and public buildings were often designed in the Art Deco Style (or the related Art, Zigzag, or Streamline Moderne styles). The construction boom of the post-war period brought residences in the Ranch style with an open plan and attached garage, often laid out in expansive suburbs of builders' tract homes. Regional malls and shopping centers developed on the outskirts of communities, while the industrial and shipping facilities of the post-war period became more intermodal as trucking competed with rail and sea transportation. The

areas along the HST Alignment Alternatives contain properties/resources of each of these types and from each decade of the twentieth century.

By far, the largest concentrations of historic buildings, structures, objects, sites, districts, and cultural landscapes (or potential historic properties/historical resources) in this region are in the urban centers of San Jose, San Francisco, and Oakland, but resources of all types appear throughout the region. A certain number of properties/resources appear in other towns, and to a lesser extent, in the rural countryside of the Santa Clara and Central valleys. Towns that were important local trade centers in the late nineteenth century, like Stockton and Merced, exhibit concentrations of historical resources along the project alignment alternatives. Rural historic properties and historical resources that appear along the HST Alignment Alternatives include farm and ranch complexes and infrastructure elements (such as water conveyance systems, bridges, industrial complexes, and rail stations).

Traditional Cultural Properties

Information regarding traditional cultural properties was derived from the NAHC's review of the Sacred Land files, the Native American Outreach Workshop, presentations at public hearings on the statewide Program EIR/EIS process, and formal comments received on the statewide Draft Program EIR/EIS.

Based on their review of the Sacred Lands file during the statewide Program EIR/EIS, the NAHC identified no traditional cultural properties near the project's APE. Letters were distributed to Native American contacts provided by the NAHC that asked for information identifying traditional cultural properties that could be affected by the project. No direct reply to the contact letters was received.

At Native American Outreach Workshops held for the statewide Program EIR/EIS, attendees provided information concerning potentially sensitive resources and concerns. At the San Luis Recreation Area workshop, concerns were raised about potential impacts on sensitive cultural resources along the HST Pacheco Pass alignment alternatives, both through the mountains and in the Santa Clara Valley between Gilroy and Morgan Hill. At public hearings held for the Statewide Program EIR/EIS, written comments were received representing tribal concerns and requesting continued involvement and consultation on subsequent planning and construction of the project. The comments also provided perspective on traditional tribal territories for the Amah Mutsun and Yokuts—tribes within the Bay Area to Central Valley project area.

Additional Native American consultation in the form of a request for review of the NAHC Sacred Lands file and additional letters to Native American potential contacts provided by the NAHC would be conducted as part of the formal consultation process during future project-level studies.

Paleontological Resources

California's rich geologic record and complex geologic history has resulted in exposure of many rock units with high paleontologic sensitivity at the surface. The fossil record in California is exceptionally prolific; abundant fossils representing a diverse range of organisms have been recovered from rocks as old as 1 billion years to as recent as 11,000 years. These fossils have provided key data for charting the course of the evolution and extinction of various types of life on the planet, both locally and globally, as well as for determining paleoenvironmental conditions, sequences and timing of sedimentary deposition, and other details of geologic history.

The major fossil-bearing units in the Bay Area to Central Valley region include the Irvington Gravels, Livermore Gravels, Merced Formation, Santa Clara Formation, Tulare Formation, Tehama Formation, Pinole Tuff, San Pablo Formation, Orinda Formation and Siesta Formation (Contra Costa Group), Briones Formation (San Pablo Group), Markley Sandstone, Nortonville Shale, Martinez Formation,

Panoche Formation, Quinto Formation, Chico Formation, Franciscan Formation, Modesto-Riverbank Formations, and the Turlock Lake-Laguna Formations. The Pleistocene and Miocene age geologic units are units with a high potential for containing vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils.

3.12.3 Environmental Consequences

A. NO BUILD ALTERNATIVE

The No Project Alternative is composed of transportation projects other than the proposed HST system that are projected to be completed between the time of this Program EIR/EIS and 2020, including local, state, and interstate transportation system improvements designated in existing plans and programs. No additional impacts on cultural resources would occur under No Project beyond those addressed in environmental documents for those projects.

Because it was not realistically feasible for this Program EIR/EIS to identify or quantify all the impacts on or mitigation activities for cultural resources associated with all of the projects considered as part of the No Project Alternative, it is assumed that the existing condition is representative of No Project conditions. It is possible that other transportation projects (not including the HST Alignment Alternatives) may impact some existing cultural resources by 2020, and that these changes to the baseline would be described and quantified in subsequent environmental analysis and reflected in future database information. This Program EIR/EIS addresses the general potential for the proposed project to affect or impact cultural resources as they exist at present and uses this information to compare the potential for impacts from the alternatives evaluated.

HIGH SPEED TRAIN ALTERNATIVE

Table 3.12-1 reports a summary of the sensitivity ranking assigned to each alignment alternative and number of recorded cultural resources present within the APE. One apparent pattern in the data is that the alignment alternatives within the San Francisco to San Jose and Oakland to San Jose Corridors have overall higher sensitivity ratings than the alignment alternatives in the Central Valley Corridor that extend from Stockton to Madera. Urban areas in the Bay Area, such as San Francisco, Oakland, and San Jose, have a high density of cultural resources that includes prehistoric, historic, and architectural resources.

The potential for impacts to paleontologic resources for each of the HST Alignment Alternatives would be directly related to the sensitivity of geologic units crossed. Actual impacts would be related closely to the placement of major excavations (cuts, tunnels, borrow pits, and foundations) relative to the geographic positions of sensitive geologic units and known fossil localities. These factors would be addressed during subsequent analyses. Table 3.12-1 also reports the sensitivity rating for encountering paleontological resources.

Additional data related to cultural resources and paleontological resources is provided in Appendix 3.12-A.

Table 3.12-1. Cultural Resources Summary Data Table for Alignment Alternatives and Station Location Option Comparisons

Corridor	Possible Alignments	Alignment	Number of Recorded Archaeological Resources	Number of Recorded Architectural Resources	Traditional Cultural Properties	Cultural Resources Ranking (High, Medium, Low)	Paleontology Sensitivity (High, Medium, Low)
San Francisco to San Jose: Caltrain	1 of 1	San Francisco to Dumbarton	16	35	No	High	Low
	1 of 1	Dumbarton to San Jose	10	24	No	High (burials, Mission)	Low
Station Location Options							
Transbay Transit Center			0	2	No	High*	Low
4th and King (Caltrain)			0	0	No	High*	Low
Millbrae/SFO			0	1	No	High	Low
Redwood City (Caltrain)			0	0	No	Low	Low
Palo Alto (Caltrain)			0	1	No	Medium	Low
Oakland to San Jose: Niles/I-880	1 of 2	West Oakland to Niles Junction	6	18	No	High	Medium
		12th Street/ City Center to Niles Junction	11	21	No	High	Medium
	1 of 2	Niles Junction to San Jose via Trimble	11	20	No	High (burials, Mission)	High
		Niles Junction to San Jose via I-880	2	2	No	Low	High
Station Location Options							
West Oakland/7th Street			0	0	No	Low	Low
12th Street/City Center			0	0	No	Medium*	Low
Coliseum/Airport			0	0	No	Low	Low
Union City (BART)			0	0	No	Low	High
Fremont (Warm Springs)			0	0	No	Low	High

Corridor	Possible Alignments	Alignment	Number of Recorded Archaeological Resources	Number of Recorded Architectural Resources	Traditional Cultural Properties	Cultural Resources Ranking (High, Medium, Low)	Paleontology Sensitivity (High, Medium, Low)
San Jose to Central Valley: Pacheco Pass	1 of 1	Pacheco	7	4	No	Medium	Low
	1 of 3	Henry Miller (UPRR Connection)	1	4	No	Medium	Low
		Henry Miller (BNSF Connection)	1	4	No	Medium	Low
		GEA North	4	5	No	Medium (burials)	Low
San Jose (Diridon)			0	1	No	Medium	Low
Morgan Hill (Caltrain)			0	0	No	Low	Low
Gilroy (Caltrain)			0	0	No	Low	Low
East Bay to Central Valley: Altamont Pass	1 of 4	I-680/ 580/UPRR	8	12	No	Medium	High
		I-580/ UPRR	6	11	No	Medium (multiple burials)	Medium
		Patterson Pass/UPRR	3	3	No	Low	Low
		UPRR	5	1	No	Low	Medium
	1 of 4	Tracy Downtown (BNSF Connection)	6	8	No	Low	Low
		Tracy ACE Station (BNSF Connection)	2	13	No	Low	Low
		Tracy ACE Station (UPRR Connection)	2	10	No	Low	Low
		Tracy Downtown (UPRR Connection)	6	5	No	Low	Low
	2 of 2	East Bay Connections	0	0	No	Low	High
Station Location Options							
Pleasanton (I-680/Bernal Rd)			0	0	No	Low	Low
Pleasanton (BART)			0	0	No	Low	Low

Corridor	Possible Alignments	Alignment	Number of Recorded Archaeological Resources	Number of Recorded Architectural Resources	Traditional Cultural Properties	Cultural Resources Ranking (High, Medium, Low)	Paleontology Sensitivity (High, Medium, Low)
Livermore (Downtown)			0	0	No	Low	Low
Livermore (I-580)			0	0	No	Low	High
Livermore (Greenville Road/UPRR)			0	0	No	Low	Low
Livermore (Greenville Road/I-580)			0	0	No	Low	High
Tracy (Downtown)			0	0	No	Low	Low
Tracy (ACE)			0	0	No	Low	Low
San Francisco Bay Crossings	1 of 2	Trans Bay Crossing – Transbay Transit Center	1	2	No	Low	Low
		Trans Bay Crossing – 4th & King	0	0	No	Low	Low
	1 of 6	Dumbarton (High Bridge)	0	0	No	Low	Low
		Dumbarton (Low Bridge)	0	0	No	Low	Low
		Dumbarton (Tube)	0	0	No	Low	Low
		Fremont Central Park (High Bridge)	0	0	No	Low	Low
		Fremont Central Park (Low Bridge)	0	0	No	Low	Low
		Fremont Central Park (Tube)	0	0	No	Low	Low
Union City (Shinn)			0	0	No	Low	Low
Central Valley	1 of 6	BNSF – UPRR	1	27	No	Low	Low
		BNSF	1	16	No	Low	Low
		UPRR N/S	4	63	No	Medium	Low
		BNSF Castle	1	20	No	Low	Low
		UPRR – BNSF Castle	4	20	No	Medium	Low
		UPRR – BNSF	4	27	No	Medium	Low

Corridor	Possible Alignments	Alignment	Number of Recorded Archaeological Resources	Number of Recorded Architectural Resources	Traditional Cultural Properties	Cultural Resources Ranking (High, Medium, Low)	Paleontology Sensitivity (High, Medium, Low)
Station Location Options							
Modesto (Downtown)			0	0	No	Medium*	**Low**
Briggsmore (Amtrak)			0	0	No	Low	**Low**
Merced (Downtown)			0	0	No	Medium*	**Low**
Castle AFB			0	0	No	Low	**Low**

Note: * Based on knowledge and experience in the area of the APE.

San Francisco to San Jose Corridor

San Francisco to Dumbarton Alignment Alternative

This alignment alternative has a high density of cultural resources within the city of San Francisco. In total, there are 16 archaeological resources and 35 recorded architectural resources. The area has been developed since the 1850s and therefore is rich in historical architecture as well as archaeological sites. The majority of prehistoric sites are shell middens, and many of the historical sites are deposits from various activities dating from the late 1800s as well as the earthquake in 1906. The alignment alternative in San Francisco goes through numerous historic districts, including the 2nd Street District, the Aronson District, and the Rincon Point/South Beach District (City and County of San Francisco Planning Department 2004). This portion of the alignment alternative includes the 1925 Army-Navy YMCA building, the 1950 Sailors Union of the Pacific building, the 1910 Commercial Block Building, the 1937 Metropolitan Electric building, the World War II era 3rd Street Retail Office Building, the China Basin Warehouse (ca. 1892), the Coal Gasification Facility (ca. 1900), and the Burlingame Commercial Building (ca. 1920s). This portion also contains the 1939 Transbay Terminal and Transbay Terminal Loop Ramp (URS 2006). The historic Transbay Terminal will be replaced with a new structure as part of the new Transbay Transit Center sometime between 2008 and 2014. This alignment alternative has a high sensitivity for prehistoric, historical, and architectural resources. No traditional cultural properties were identified within the APE.

The overall paleontological sensitivity within this alignment alternative is low. Nonsensitive Franciscan sandstone, Quaternary alluvium, and artificial bay fill underlies this alignment alternative. The existing Caltrain right-of–way extends across nonsensitive Quaternary alluvium.

Dumbarton to San Jose Alignment Alternative

This alignment alternative has a low density of previously recorded cultural resources until it reaches San Jose, where it has a high density of cultural resources. A total of 10 archaeological resources and 24 architectural resources are located within the APE. These include a 1927 commercial building, the 1941 Silver Springs Underpass, the 1898 Sunol Aqueduct, the 1861 Sanborn/Bunting House, segments of the San Francisco and San Jose Railroad (ca.1860s), and recorded residential properties from the 1890s to the 1940s. The alignment alternative also contains additional historic structures including the city of Mountain View adobe (ca. 1933), the FMC complex in San Jose (ca. 1948), the Union Pacific Rail yard Complex (ca. 1925), and recorded residential buildings dated from the 1880s to the 1940s. One archaeological site in San Jose, the Santa Clara de Asis Mission, includes both prehistoric and historic resources. The Mission was built by the Spanish in the late eighteenth century in order to convert local Native Americans to Christianity. Many of the neophyte converts lived in villages on the perimeter of the mission complex resulting in a mix of historical and prehistoric archaeological deposits, including burials. The portion of the Dumbarton to San Jose alignment alternative that traverses San Jose has a high sensitivity for prehistoric, historical, and architectural resources. No traditional cultural properties were identified within the APE.

Similar to the San Francisco to Dumbarton alignment alternative, this alignment alternative potentially has a low paleontological sensitivity.

San Francisco to San Jose Corridor Stations

Three of the station location options have recorded cultural resources that are within the APE. Millbrae Train Station was built in 1907 after a fire that destroyed the original station built in 1864. It is now a railroad museum located approximately 200 ft from the modern train station. The Palo Alto train station was built in 1941 and included on the NRHP in 1996. The Transbay Transit Center APE includes the Transbay Terminal and the Transbay Terminal Loop Ramp. The station location options within San Francisco also have a large number of unrecorded architectural resources adjacent to them.

The overall paleontological sensitivity for each of the station location options is low. Specific impacts to paleontologic resources associated with construction of the station location options requires additional information concerning exact locations and subsurface geology. Additional paleontologic resources assessment would take place at the project level after the station designs are more fully defined.

Oakland to San Jose Corridor

West Oakland to Niles Junction Alignment Alternative

In total, there are six recorded archaeological sites and 18 recorded architectural resources within the APE of this alignment alternative. The majority of resources are located within the city of Oakland. These include the 1924 Clorox Chemical Building, the 1926 PG&E Gas Compressor House, industrial complexes dating from the 1920s and 1940s, and 12 recorded residential properties dating from the 1880s to the 1940s. Prehistoric sites in this area tend to be shell middens and occupation sites. Historical sites as well as architectural resources are typically associated with the late 1800s to early 1900s. The alignment alternative also traverses the Old Oakland Historic District. Portions of the alignment alternative outside Oakland have a medium to low sensitivity. This alignment alternative has a high density of cultural resources and has a high sensitivity for prehistoric, historic, and architectural resources. No traditional cultural properties were identified within the APE.

About one third of this alignment alternative crosses high-sensitivity older Pleistocene alluvial deposits. The remaining length is underlain by low-sensitivity Quaternary alluvium. Overall, this alignment alternative would have a medium paleontological sensitivity.

12th Street/City Center to Niles Junction Alignment Alternative

This alignment alternative has the highest density of cultural resources within this corridor. In total, there are 11 recorded archaeological sites and 21 recorded architectural resources within the APE. As in the West Oakland to Niles Junction alignment alternative, the majority of resources are located within the city of Oakland. These include the White Brothers' Hardwood Store (ca. 1927), the Weld-Rite Company Building (ca. 1925), the Art Moderne Sales office building (ca. 1938), and 18 recorded residential properties dating from the 1880s to the 1920s. This alignment alternative has a high sensitivity for prehistoric, historical, and architectural resources. No traditional cultural properties were identified within the APE.

Similar to the West Oakland to Niles Junction alignment alternative, this alignment alternative potentially has a medium paleontological sensitivity.

Niles Junction to San Jose via Trimble Alignment Alternative

This alignment alternative has the second highest density of cultural resources within this corridor. In total, there are three recorded archaeological sites and eight recorded architectural resources within the APE. As in the Dumbarton to San Jose alignment alternative, the majority of resources are located within San Jose, which includes the Santa Clara de Asis Mission. This portion of the project includes the Kraft Foods plant (ca.1950), the Moderne Factory building (ca. 1940), and recorded residential properties. The portion of this alignment alternative that traverses San Jose has a high sensitivity for prehistoric, historical, and architectural resources. No traditional cultural properties were identified within the APE.

About one third of this alignment alternative crosses high-sensitivity older Pleistocene alluvial deposits east of the Hayward Fault. The exact alignment alternative could greatly influence impacts along this reach. The alignment alternative also crosses an area of Pleistocene alluvium and a short segment of Holocene intertidal deposits of low sensitivity. In the south part of the alignment alternative just north of West Trimble Road and the Mineta San Jose Airport, the remains of a Pleistocene mammoth were discovered in 2005. The area along the Guadalupe River would have a high paleontological sensitivity. (U.S. Geological Survey 2006b).

Niles Junction to San Jose via I-880 Alignment Alternative
This alignment alternative has two archaeological resources and two recorded architectural resources dating from 1928 and 1945. It has a medium sensitivity for archaeological and architectural resources. No traditional cultural properties were identified within the APE.

About one third of this segment crosses high-sensitivity older Pleistocene alluvial deposits east of the Hayward Fault. Elsewhere, the alignment alternative crosses an area of Pleistocene alluvium and a short segment of Holocene intertidal deposits of low sensitivity. Similar to the Niles Junction to San Jose via Trimble alignment alternative, this alignment alternative potentially has a high paleontological sensitivity along the Guadalupe River.

Oakland to San Jose Corridor Station Location Options
One of the station location options has recorded cultural resources that are within the APE or directly adjacent to the APE. Diridon Station was constructed in 1935 and added to the NRHP in 1993. The station location options within Oakland do not have recorded cultural resources within the APE but have a large number of unrecorded architectural resources adjacent to them. No traditional cultural properties were identified within the APE.

The overall paleontological sensitivity for the station location options in this corridor is low, except for the Union City (BART) and Fremont (Warm Springs) station location options, which is high. Specific impacts to paleontologic resources associated with construction of the station location options require additional information concerning exact locations and subsurface geology. Additional paleontologic resources assessment would take place at the project level after the station designs are more fully defined.

San Jose to Central Valley Corridor

Pacheco Alignment Alternative
This alignment alternative roughly follows Highway 152 through the Pacheco Pass. Little development has taken place in this area. In total, four recorded architectural resources were found to be located within the project APE. Of these, two are historic canals and one is a bridge. There are also likely historic resources in the Santa Clara Valley, including Morgan Hill and Gilroy. Seven previously recorded archaeological resources are located within the APE. Three of them are small prehistoric sites that typically include midden and lithic debitage. Though little archaeological work has been conducted in this area, it is known to be highly sensitive for prehistoric archaeological resources. Overall, this alignment alternative has medium sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

This alignment alternative extends through areas mapped as Franciscan ultramafic rocks and Quaternary terrace and alluvium, all ranking low in paleontological sensitivity. A portion of the alignment alternative near Gilroy passes through Plio-Pleistocene alluvial deposits similar to those which have yielded vertebrate fossils elsewhere and is assigned high sensitivity. The remaining portion falls on nonsensitive lower and upper Cretaceous marine rocks. Overall, this alignment alternative was identified to have a low sensitivity for paleontological resources.

Henry Miller (UPRR Connection) Alignment Alternative
The majority of this alignment alternative is in Merced County in the Central Valley. Much of the area has seen little development historically. Previously recorded resources present include one archaeological site and four architectural resources. Overall, this alignment alternative has a medium sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

In the vicinity of San Luis Reservoir, the alignment alternative crosses the Los Banos Alluvium, a sensitive unit that could include vertebrate fossils. The Pacheco and Modesto Formations along this alignment alternative warrant a medium sensitivity ranking. The remaining length of the alignment

alternative to the UPRR connection falls within the Franciscan Group, San Luis Ranch Alluvium, Dos Palos Alluvium, and artificial fill, none of which are sensitive for paleontological resources. Overall, this alignment alternative was identified to have a low sensitivity for paleontological resources.

Henry Miller (BNSF Connection) Alignment Alternative
This alignment alternative would have the same known resources as identified for the Henry Miller (UPRR Connection) alignment alternative.

This alignment alternative would have similar paleontological sensitivity as the Henry Miller (UPRR Connection) alignment alternative.

GEA North Alignment Alternative
This alignment alternative is in Merced County in the Central Valley. Much of the area has seen little development historically. Previously recorded resources present include four archaeological sites and five architectural resources. All four of the archaeological resources are prehistoric sites, including a habitation site and human burials just west of the city of Merced. Overall, this alignment alternative has medium sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

In the vicinity of San Luis Reservoir, the alignment alternative crosses the Los Banos Alluvium, a sensitive unit that could include vertebrate fossils. The remaining length of the alignment alternative to the UPRR or BNSF connection falls within formations that are not sensitive for paleontological resources. Overall, this alignment alternative was identified to have a low sensitivity for paleontological resources.

San Jose to Central Valley Corridor Station Location Options
Only the San Jose Diridon station location option within this corridor has a recorded architectural resource that is within the APE or directly adjacent to the APE. No traditional cultural properties were identified within the APE.

The overall paleontological sensitivity for each of the station location options is low. Specific impacts to paleontologic resources associated with construction of the station location options requires additional information concerning exact locations and subsurface geology. Additional paleontologic resources assessment would take place at the project level after the station designs are more fully defined.

East Bay to Central Valley Corridor

I-680/580/UPRR Alignment Alternative
This alignment alternative spans from the eastern Bay Area to the Livermore Valley and has the highest density of cultural resources within this corridor. Much of the area has seen recent development. Along this alignment alternative, there are eight previously recorded archaeological sites. There are 12 recorded architectural resources, including the Western Pacific Railroad Buildings (ca. 1909), the Kennedy Ranch (ca. 1890), and 10 residential (mainly Craftsman) properties dating from 1910 to 1940. The archaeological resources are prehistoric sites. Overall, this alignment alternative has medium sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

This alignment alternative extends through approximately 7 miles of Pleistocene alluvium and sediments and approximately 2 miles of Miocene sedimentary rock, all of which may have a high sensitivity for paleontological resources. The remaining length of the alignment alternative falls within formations that are not sensitive for paleontological resources. Overall, this alignment alternative was identified to have a high sensitivity for paleontological resources.

I-580/UPRR Alignment Alternative
The Livermore Valley has seen little archaeological work until recently though it is known to be rich in prehistoric resources, including large habitation sites and burials. Several unrecorded burials are located immediately adjacent to the APE just west of the city of Livermore. Previously recorded resources within the alignment alternative include six archaeological sites and 11 architectural resources. Recorded resources include a 1947 industrial warehouse, the Quonset Warehouse (ca. 1950s), the West Altamont Underpass (ca. 1909), and eight recorded residential properties dating between 1890 and the 1930s. The archaeological resources are prehistoric sites. Overall, this alignment alternative has medium sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

This alignment alternative also extends through approximately 7 miles of Pleistocene alluvium and sediments and over 2 miles of Miocene sedimentary rock, all of which may have a high sensitivity for paleontological resources. Overall, this alignment alternative was identified to have a medium sensitivity for paleontological resources.

Patterson Pass/UPRR Alignment Alternative
This alignment alternative includes three previously recorded archaeological resources and three architectural resources. Overall, this alignment alternative has low sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

This alignment alternative extends through approximately 2 miles of Pleistocene alluvium and sediments and over 9 miles of Miocene sedimentary deposits along Patterson Pass. Overall, this alignment alternative was identified to have a low sensitivity for paleontological resources.

UPRR Alignment Alternative
This alignment alternative includes five previously recorded archaeological resources and one architectural resource. Overall, this alignment alternative has low sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

This alignment alternative extends through approximately 2.5 miles of Pleistocene alluvium and sediments and approximately 1 mile of Miocene sedimentary deposits. Overall, this alignment alternative was identified to have a medium sensitivity for paleontological resources.

Tracy Downtown (BNSF Connection) Alignment Alternative
This alignment alternative includes eight previously recorded archaeological resources and 10 architectural resources. Some of the archaeological sites are prehistoric and include midden sites with few to no artifacts or related materials. The majority of the architectural resources are located south of Tracy. Overall, this alignment alternative has a low sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

The west end of this alignment alternative extends through more than 2 miles of Miocene sedimentary deposits. The remaining length of the alignment alternative falls within formations that are not sensitive for paleontological resources. Overall, this alignment alternative was identified to have a low sensitivity for paleontological resources.

Tracy ACE Station (BNSF Connection) Alignment Alternative
This alignment alternative includes two previously recorded archaeological resources and 13 architectural resources. Recorded resources include eight World War II era warehouses, a 1952 U.S. Army Depot flagpole, and four U.S. Army Depot buildings from the 1950s. Some of the archaeological sites are prehistoric and include midden sites with few to no artifacts or related materials. The majority of the architectural resources are located south of Lathrop. Overall, this

alignment alternative has low sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

The west end of this alignment alternative extends through approximately 6 miles of Miocene sedimentary deposits. The remaining length of the alignment alternative falls within formations that are not sensitive for paleontological resources. This alignment alternative, along with the Tracy ACE Station (UPRR Connection) alignment alternative, would have the highest potential to affect paleontological resources compared to the other alignment alternatives within this corridor. Overall, this alignment alternative was identified to have a low sensitivity for paleontological resources.

Tracy ACE Station (UPRR Connection) Alignment Alternative
This alignment alternative includes two previously recorded archaeological resources and 10 architectural resources. Similar to the other Tracy alignment alternatives, the archaeological resources include midden sites, and the majority of the architectural resources are located south of Lathrop. Overall, this alignment alternative has low sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

The west end of this alignment alternative extends through approximately 6 miles of Miocene sedimentary deposits similar to the Tracy ACE Station (BNSF Connection) alignment alternative. Overall, this alignment alternative was identified to have a low sensitivity for paleontological resources.

Tracy Downtown (UPRR Connection) Alignment Alternative
This alignment alternative includes eight previously recorded archaeological resources and seven recorded architectural resources. These include an undated wooden Western Pacific Railroad trestle, two industrial warehouses from the 1950s, residential properties from the 1940s, and an undated farmstead property. Similar to the Tracy Downtown (BNSF Connection) alignment alternative, the archaeological resources include midden sites, and the majority of the architectural resources are located south of Tracy. Overall, this alignment alternative has a low sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

The west end of this alignment alternative extends through approximately over 2 miles of Miocene sedimentary deposits similar to the Tracy Downtown (BNSF Connection) alignment alternative. Overall, this alignment alternative was identified to have a low sensitivity for paleontological resources.

East Bay Connections Alignment Alternative
The East Bay Connections alignment alternative is not known to have cultural resources that are within the APE or directly adjacent to the APE. No traditional cultural properties were identified within the APE.

This alignment alternative would extend through approximately 1,000 ft of Pleistocene alluvium deposits and about one mile of Miocene sedimentary deposits. These units may have a high sensitivity to paleontological resources.

East Bay to Central Valley Corridor Station Location Options
Based on the archival records search, none of the station location options have cultural resources that are within the APE or directly adjacent to the APE. The station location options were found to have a low sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

The overall paleontological sensitivity for the stations in this corridor is low, except for the Livermore (I-580) and Livermore (Greenville Road/I-580) stations, which are high. Specific impacts to paleontologic resources associated with construction of the station location options require additional

information concerning exact locations and subsurface geology. Additional paleontologic resources assessment would take place at the project level after the station designs are more fully defined.

San Francisco Bay Crossings Corridor

Trans Bay Crossing – Transbay Transit Center Alignment Alternative
Most of this alignment alternative is below the San Francisco Bay and therefore has very low sensitivity for archaeological resources. However, the terrestrial portions are highly sensitive for both historical archaeological deposits and architectural resources. One resource, the Transbay Terminal, was built in 1939 as a California Toll Bridge Authority facility in order to facilitate commuter rail travel across the lower portion of the San Francisco-Oakland Bay Bridge. The historic Transbay Terminal will be replaced along with the Transbay Terminal Loop Ramp with a new structure as part of the new Transbay Transit Center sometime between 2008 and 2014. Another resource within the APE is the Historic Ferry Building. Originally constructed in 1903, it was the second busiest transportation terminal in the world during the 1930s. Previous subsurface archaeological testing has revealed that much of the area is rich with historic artifacts from the Gold Rush period through the 1906 earthquake and resulting fire. This alignment alternative also traverses the Embarcadero Piers Historic District (City and County of San Francisco Planning Department 2004). No traditional cultural properties were identified within or adjacent to the APE.

This alignment alternative would extend through mud deposits and Quaternary dune sand deposits. Because of the low likelihood of these units containing significant paleontological resources, this alignment alternative has a low paleontological sensitivity.

Trans Bay Crossing – 4th and King Alignment Alternative
Like the Trans Bay Crossing – Transbay Transit Center alignment alternative, this alignment alternative is below the San Francisco Bay and therefore has very low sensitivity for archaeological resources. However, the terrestrial portions are highly sensitive for both historical archaeological deposits and architectural resources. Previous subsurface archaeological testing has revealed that much of the area is rich with historic artifacts from the Gold Rush period through the 1906 earthquake and resulting fire. No traditional cultural properties were identified within or adjacent to the APE.

This alignment alternative would have similar paleontological sensitivity as the Trans Bay Crossing – Transbay Transit Center alignment alternative.

Dumbarton Alignment Alternative (High Bridge, Low Bridge, Tube)
Four recorded archaeological resources were identified along this alignment alternative. The prehistoric sites include a habitation site associated with burials, while the historic sites resulted from early 1900s industrial activities. No recorded architectural resources were identified in the records search for this alignment alternative. The cultural resources sensitivity for this alignment alternative is low. No traditional cultural properties were identified within or adjacent to the APE.

This alignment alternative would extend through mud deposits and Quaternary dune sand deposits on the San Francisco and Oakland side of the Bay, which have low sensitivity for paleontological resources. The alignment alternative would also extend through a small portion of Pleistocene alluvium on the Oakland side of the Bay, which has a high sensitivity for paleontological resources. Overall, this alignment alternative has a low paleontological sensitivity.

Freemont Central Park Alignment Alternative (High Bridge, Low Bridge, Tube)
No recorded archaeological or architectural resources were identified in the records search for of this alignment alternative. No traditional cultural properties were identified within or adjacent to the APE.

This alignment alternative is generally similar in paleontological sensitivity as the Dumbarton alignment alternative except where the alignment alternative would extend through Pleistocene alluvium on the Oakland side of the Bay. This alignment alternative extends for about a mile through this unit, which has a high paleontological sensitivity. Overall, this alignment alternative has a low paleontological sensitivity.

Central Valley Corridor

BNSF/UPRR Alignment Alternative
This alignment alternative and all of those within this corridor trend north-south through the Central Valley beginning south of Stockton to just south of Chowchilla. This alignment alternative generally follows existing railroad lines. In total, there is one previously recorded archaeological resource and 27 architectural resources. These include a 1947 railroad trestle, a 1950 flatcar railroad bridge, Robertson Boulevard (ca. 1913); Redrock Winery (ca. 1920); Le Grand Canal (ca. 1910), and 22 recorded residential properties dating between 1920 and the 1940s. Most of the architectural resources are within the cities of Escalon and Chowchilla. Overall, this alignment alternative has low sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

This alignment alternative would cross Quaternary dune sand deposits between Atwater and Merced. Because of the low likelihood of these units containing significant paleontological resources, this alignment alternative has a low potential to encounter paleontological deposits.

BNSF Alignment Alternative
Similar to the BNSF/UPRR alignment alternative, this alignment alternative generally follows existing railroad lines. In total, there is one previously recorded archaeological resource and 16 recorded architectural resources. These include the 1912 Escalon Water and Auxiliary Water Systems; the 1935 Escalon Sanitary Sewer System; portions of the 1895 Atchison, Topeka, and Santa Fe Railroad; Bud's Frosties (ca. 1946); Farmer Bill's Produce (ca. 1940); and 11 recorded residential properties dating between 1910 and the 1940s. Most of the architectural resources are within or around the city of Escalon. Overall, this alignment alternative has low sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

Similar to the BNSF/UPRR alignment alternative, this alignment alternative has a low potential to encounter paleontological deposits.

UPRR N/S Alignment Alternative
Similar to the BNSF/UPRR alignment alternative, this alignment alternative generally follows existing railroad lines. In total, there are four previously recorded archaeological resources and 63 architectural resources. Some of the archaeological resources are prehistoric sites, including a habitation site associated with burials, while the historic sites resulted from early 1900s industrial activities. Most of the architectural resources are around the communities of Delhi, Livingston, Atwater, and Chowchilla. There is a series of historic canals recorded in this portion of the alignment alternative including the Ashe Lateral (ca. 1890s), the Fairfield Canal (ca. 1910), the 1920 Arena Canal, and seven other unnamed canals dating to ca. 1900. There are also four freeway bridges dating from the 1940s. This portion includes la Fuentes Market (ca.1940) and A.V. Produce (ca. 1925), as well as 43 recorded residential properties dating from the 1890s to the 1950s. Overall, this alignment alternative has medium sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

Similar to the BNSF/UPRR alignment alternative, this alignment alternative has a low potential to encounter paleontological deposits.

BNSF Castle Alignment Alternative
Similar to the BNSF/UPRR alignment alternative, this alignment alternative generally follows existing railroad lines. In total, there is one previously recorded archaeological resource and 20 architectural resources. Most of the architectural resources are within the cities of Escalon and Chowchilla, such as the Escalon Motel (ca. 1940s), a 1926 Texaco Station, and Wright's Petroleum (ca.1918). Some of the architectural resources are single-family residences (11 recorded) built in the early 1900s. There are also features associated with the railroad such as a 1909 wooden railroad trestle and portions of the Tidewater Southern Railroad dating from 1912. Overall, this alignment alternative has low sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

Similar to the BNSF/UPRR alignment alternative, this alignment alternative has a low potential to encounter paleontological deposits.

UPRR-BNSF Castle Alignment Alternative
Similar to the BNSF/UPRR alignment alternative, this alignment alternative generally follows existing railroad lines. In total, there are four previously recorded archaeological resources and 20 architectural resources. The recorded architectural resources include the Riverbank Library (ca. 1899), irrigation canals (ca. 1900), 1904 railroad bridge, 1910 farmstead, and numerous (13 recorded) residential properties dating between 1900 and 1950. This portion also contains segments of the 1895 Atchison, Topeka, and Santa Fe Railroads. Some of the archaeological resources are prehistoric sites, including a habitation site associated with burials, while the historic sites resulted from early 1900s industrial activities. Most of the architectural resources are around the cities of Modesto and Merced. Overall, this alignment alternative has medium sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

Similar to the BNSF/UPRR alignment alternative, this alignment alternative has a low potential to encounter paleontological deposits.

UPRR-BNSF Alignment Alternative
Similar to the BNSF/UPRR alignment alternative, this alignment alternative generally follows existing railroad lines. There are four previously recorded archaeological resources within this alignment alternative and 27 recorded architectural resources, including three ca. 1940 highway bridges, abandoned segments of State Route 99 that are potentially historic, 1940s farms and associated structures, and numerous (19 recorded) residential properties dating between ca. 1900 and 1950. Some of the archaeological resources are prehistoric sites including a habitation site associated with burials, while others are historic sites resulting from early 1900s industrial activities. Most of the architectural resources are around Chowchilla. Overall, this alignment alternative has medium sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

Similar to the BNSF/UPRR alignment alternative, this alignment alternative has a low potential to encounter paleontological deposits.

Central Valley Corridor Station Location Options
Based on the archival records search, none of the station location options have known cultural resources that are within the APE or directly adjacent to the APE. Only the Modesto (Downtown) and Merced (Downtown) station location options were found to have a medium sensitivity for cultural resources. No traditional cultural properties were identified within the APE.

The station location options within this corridor would be located within formations with a low likelihood of containing significant paleontological resources; therefore, the station location options would have a low potential to encounter paleontological deposits.

3.12.4 Conclusion

One factor that contributes to the difference in density of cultural resources for the various alignment alternatives should be considered—no archaeological surveys have been conducted. Much of the Central Valley has not been subjected to formal archaeological survey. This is also true for many of the alignment alternative areas that span between urban centers in the Bay Area. Because of this, there is potential for numerous unrecorded (mostly prehistoric) cultural resources to be located within the project-level APEs. A formal, systematic survey should be conducted prior to any ground disturbing activities. All previously recorded resources within the project-level APEs need to be evaluated for inclusion on the CRHR.

3.12.5 Design Practices

The Authority and FRA are committed to avoiding potential impacts to cultural resources through careful alignment alternative design and selection. The Authority is committed to avoiding impacts to cultural resources to the extent feasible and practical.

The Authority would develop procedures for fieldwork, identification, evaluation, and determination of potential effects to cultural resources in consultation with SHPO and Native American tribes. Onsite monitoring is often incorporated in the fieldwork when sites are known or suspected of containing Native American human remains. The procedures need to comply with federal and state statutes concerning burials.

3.12.6 Mitigation Strategies and CEQA Significance Conclusions

Based on the analysis above, and considering the CEQA Appendix G thresholds of significance for cultural and historic resources, the HST Alignment Alternatives would have a potentially significant effect on cultural and historic resources when viewed on a systemwide basis. Although placing the alignment alternative for the HST system within or along existing transportation corridors reduces the potential for adverse effects to many resources, providing HST service to and placing potential station location options in metropolitan centers increases the potential for adverse impacts to cultural and historic resources. Additional avoidance and mitigation strategies would be applied in the project-level analyses. However, some cultural and historic resources would likely be adversely affected. At the program level of analysis, it is not possible to know precisely the location, extent, and particular characteristics of impacts to these resources. Because of this uncertainty, at the program-level of analysis the impact is considered significant. Mitigation strategies, as well as the design practices discussed in Section 3.12.7, Subsequent Analysis, would be applied to reduce these impacts.

General mitigation strategies are discussed in this section as part of this program-level evaluation. The Authority and FRA would consult with SHPO to define and describe general procedures to be applied in the future for fieldwork, methods of analysis, and the development of specific mitigation measures to address effect and impacts on cultural resources, which would be reflected in a programmatic agreement between the Authority, FRA, and SHPO. The Authority and FRA would also continue to consult with Native American tribes concerning the proposed undertaking, as required by federal and state laws concerning the management of historic properties/historical resources. Mitigation measures would be required for adverse effects (significant under CEQA) on cultural resources that are listed, determined eligible for, or that appear to be eligible for listing in the NRHP or CRHR. The mitigation measures ultimately selected for this undertaking would meet the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716-44740), as well as standards and guidelines for historic preservation activities established by the California SHPO.

At the conclusion of the program-level environmental review process, the Authority and the FRA, in consultation with the SHPO, would develop a programmatic agreement (PA) to describe expectations for the next phase of fieldwork, eligibility determination, and documentation under Section 106 of NHPA and pursuant to CEQA. The PA may specify procedures for the identification and evaluation of impacts for

future projects and the site-specific work that would be required during project-level environmental review.

These potential measures provide two levels of mitigation and are organized by resource type. One level of mitigation strategies are those that, when implemented as conditions of project approval, would enable the project to avoid an adverse effect or impact. The other level of mitigation includes measures that would lessen the degree of adverse effect or impact. No one measure presented in this section would mitigate all adverse effects or impacts; however, some combination of these measures and others agreed to during the project phases of the program would emerge as the mitigation for this project.

In general, there is a wide range of actions that can qualify as mitigation, depending on the type of project, the type of property, and impacts the project may have on cultural resources. The following list presents some of the principles that generally guide mitigation development in historic preservation practice.[6]

- Mitigation measures should correspond or be directly related to the resource being affected, rather than in a compensatory fashion that does not relate to the affected resource.
- Mitigation should be consistent with the significance of the historic property and correspond to the severity of project effects on the historic property.
- Mitigation must be relevant to the goals of historic preservation, rather than as an enhancement of the project to which it is related or as an enhancement to amenities unrelated to the affected properties.
- Mitigation measures that are chosen should be a worthwhile use of public funds and provide a high degree of public benefit relative to the cost.
- Mitigation measures should benefit the greatest number of people, particularly those members of the interested public rather than only those of a specialized audience or particular group.
- Historic properties that would be demolished or greatly altered should be documented in permanent forms.

At a program-level of analysis (as discussed above) it is not possible to know precisely the location, extent, and particular characteristics of impacts to cultural resources. Given that the impacts are considered significant, the following mitigation measures will be applied as appropriate.

A. ARCHAEOLOGICAL RESOURCES

The following are potential mitigation measures for eligible or listed archaeological sites:

- Avoid the impact, and when avoidance cannot be accommodated, consider minimizing the scale of the impact.
- Incorporate the site into parks or open space (PRC § 21083.2).
- Cap or cover the site before construction.
- Provide data recovery.
- Develop procedures for fieldwork, identification, evaluation, and determination of potential effects to cultural resources in consultation with SHPO and Native American tribes. Onsite monitoring is often incorporated in the fieldwork when sites are known or suspected of

[6] These factors are based on those presented in: Caltrans, "San Francisco-Oakland Bay Bridge East Span Seismic Safety Project, Consideration of Proposed Mitigation Measures," September 1999.

containing Native American human remains. The procedures need to comply with federal and state statutes concerning burials.

Avoidance is preferred, but if adjustments to the alignment alternative plan or profile are not feasible, data recovery may be provided. When impacts will destroy or affect the data potential of a property (NRHP Criterion D/CRHR Criterion 4), data recovery may consist of archaeological excavation of an adequate sample of site contents so that the research questions applicable to the site can be addressed. Recovery of important information from the site mitigates the information loss that will result from site destruction. If only part of a site is impacted by the project, data recovery will only be necessary for that portion of the site. Data recovery will not be required if the agency determines prior testing and studies have adequately recovered the scientifically consequential information from the resources (CEQA Guidelines, 14 C.C.R. § 15126.4[b]).

When other NRHP or CRHR criteria are relevant (e.g., Criterion A/1; Criterion B/2; Criterion C/3) or when a traditional cultural property is involved, it is often necessary to consider more diverse mitigation measures.

B. HISTORIC PROPERTIES/RESOURCES

Measures to avoid adverse effects will include steps taken in both the design and construction phases of the project. Avoidance has occurred and will occur during the design phase by not including components that could possibly effect or impact historic properties/resources. Avoidance will also occur by conducting construction activities in a manner to actively evade historic properties/resources.

The following are potential mitigation measures for historic properties/resources.

Stabilization/Monitoring during Construction. The lead agency will prepare a treatment plan that will present a detailed methodology for the protection of historic properties/resources, such as buildings, structures, objects, and sites, and cultural landscape elements that are in close proximity to construction activities. This treatment plan will describe methods for the preservation, stabilization, shoring/underpinning, and monitoring of buildings, structures, and objects. The treatment plan will also include provisions that high vibration construction techniques would be avoided in sensitive areas. Underpinning and/or other stabilization methods will be used at buildings located near project construction areas that may be susceptible to damage or inadvertent destruction.

Measures to Lessen Adverse Effects. Measures to minimize project impacts to historic properties/resources will occur in pre-construction, construction, and post-construction phases. Many of these mitigation measures will require careful agency review and may require stipulations in the contracts of the construction contractors to ensure appropriate preservation of cultural resources.

Recordation. The lead agency will ensure that cultural resources adversely affected by the project will be recorded and documented to the standards of the Historic American Building Survey (HABS) or Historic American Engineering Record (HAER). This will require coordination with the NPS HABS/HAER program to determine the appropriate level of recordation. This coordination will also address the adequacy of recordation previously conducted for historic properties/resources that may be adversely affected.

Design Guidelines. The lead agency will ensure that design guidelines are developed to ensure sympathetic, compatible, and appropriate designs for new construction. Aesthetic details can be considered mitigation, but there may be a limit to the amount of change possible in the design once important engineering and environmental considerations have been taken into account. It is most likely that the design guidelines mitigation will apply to the visual appearance of the project rather than specifics of alignment alternative, overall depth/width, or placement of supports. Design

guidelines will be informed by the documentation prepared under HABS/HAER standards. It will be necessary for an architectural historian or a historical architect to advise the structural designers on appropriate architectural treatments that serve as mitigation. SHPO and other agencies will review draft design guidelines and provide comment on the guidelines as well as on proposed design changes.

Interpretive/Educational Materials and Popular Report. The lead agency will prepare interpretive and/or educational materials and programs regarding the affected historic properties/resources. The focus of this mitigation will be the historic themes related to these resources. Such materials and/or programs may include a popular report, documentary videos, booklets, interpretive signage, and additional interpretive information made available to state and local agencies. These materials may also include salvage items, historic drawings, interpretive drawings, current and historic photographs, models, and oral histories. Assistance will also be provided for archiving or digitizing the documentation of cultural resources affected, as well as for the dissemination of the material to appropriate repositories.

Relocation. Historic properties/resources that will be otherwise demolished because of the project may be relocated and rehabilitated. In consultation with the NPS, the lead agency will ensure that these buildings or structures are recorded to HABS standards prior to their removal. The lead agency/project proponent will be responsible for preparing a removal plan, including site plans for the new locations, and placing the resource on new foundations according to conditions consistent with those that existed prior to the move.

Monitoring (Architectural/Cultural Landscape). The project construction documents and new construction will be monitored to ensure they conform to the design guidelines and any other treatment procedures agreed to by the consulting parties. A professional architectural historian and a professional historical landscape architect who meet the Secretary of the Interior's *Professional Qualifications Standards* (48 FR 44738-9) will monitor construction to identify conditions that conflict with the mitigation measures. The lead agency will take steps to correct these conflicts.

Minor Repairs and Reconstruction. The lead agency will ensure that inadvertent damage to historic properties/resources is repaired in accordance with the Secretary of the Interior's *Standards for Treatment of Historic Properties*.

Salvage. The lead agency will ensure that selected decorative or architectural elements of the adversely affected historic properties/resources are reviewed for feasibility of salvage in order to mitigate their loss or destruction. Where possible, these elements will be retained and incorporated into the new construction. Where re-use is not possible, selected salvaged elements will be made available for use in interpretive displays either near the affected resources or at another appropriate venue, such as a museum.

C. PALEONTOLOGICAL RESOURCES

Mitigation measures for paleontological resources would be developed and implemented at the project level. The following measures may be included.

- Educate workers.
- Recover fossils identified during the field reconnaissance.
- Monitor construction.
- Develop protocols for handling fossils discovered during construction, likely including temporary diversion of construction equipment so that the fossils could be recovered; identified; and

prepared for dating, interpreting, and preserving at an established, permanent, accredited research facility.

The above mitigation strategies, including implementation of a PA addressing historic resources and continued consultation and coordination with tribal representatives, are expected to substantially lessen or avoid impacts to cultural and historic resources in most circumstances. At the project-level of review, it is expected that for proposed HST Alignment Alternatives that result in impacts to cultural and historic resources, most of the impacts will be mitigated to a less-than-significant level, but it is possible that for some alignment alternatives, impacts will be significant. Sufficient information is not available at the program level to conclude with certainty that the above mitigation strategies will reduce impacts to affected resources to a less-than-significant effect in all circumstances. Therefore, potential impacts to cultural and historic resources are considered significant at the program level even with the application of mitigation strategies. Additional environmental assessment will allow more precise evaluation in project-level environmental analyses.

3.12.7 Subsequent Analysis

The following paragraphs describe the procedures that would be necessary at the project-level stage of environmental review to determine appropriate and feasible mitigation measures in consultation with the SHPO, if a decision is ultimately made to go forward with the proposed HST system. These procedures would satisfy the NHPA and CEQA requirements.

As allowed under 36 CFR § 800.4(b)(2), a phased approach to identification of historic properties can be used when the proposed undertaking involves corridors. As indicated by the results of this study, FRA and the Authority have determined that historic properties likely exist along various corridor alignment alternatives through background research, consultation, and abbreviated field reconnaissance. Once alignment alternatives have been refined at the project level, full identification efforts may proceed. Under NHPA Section 106 and implementing regulations (36 CFR § 800), the procedures would include identifying resources with the potential to be affected, evaluating their significance under NRHP and CEQA, identifying any substantial adverse effects, and then evaluating potential mitigation.

In the interest of identifying archaeological sites within the project-level APE, a field survey should be completed which would identify those sites evident on the surface, geomorphological maps and studies should be reviewed to assess the potential for the project-level APE to contain significant buried sites, and historic maps and an historic overview or context should be developed in the interest of identifying potential historical archaeology sites within the project-level APE.

Additional efforts must also be made to consult with appropriate tribes and individuals knowledgeable about the nature and locations of potential traditional cultural properties.

Identifying potentially affected archaeological and historical properties/resources would require identification and evaluation within a more specifically defined project-level APE that would include the area where direct and indirect impacts from construction could occur (including locations of easements and construction-related facilities, such as equipment staging areas, borrow and disposal areas, access roads, and utilities) and the areas where the settings of any eligible historic buildings and structures, or the buildings and structures themselves, could be materially or significantly altered.

All identified resources would then be evaluated using NRHP and CRHR eligibility criteria. Evaluating archaeological sites may require preparing test plans for archaeological resources that contain regionally relevant research questions. The Authority and the FRA would consult with the SHPO on any test plans and determinations of eligibility for evaluated resources. The impacts of a proposed specific project on resources determined eligible would be analyzed. An impact analysis report may then be reviewed with the SHPO. Mitigation measures needed to address impacts on specific resources could then be developed and incorporated in MOAs between the SHPO, the Advisory Council on Historic Preservation,

the FRA, and the Authority during the preparation of site-specific environmental evaluation. The mitigation measures in the MOAs would then be incorporated into site-specific environmental documentation and project approvals.

A paleontological resource assessment program would also be completed as part of the subsequent analysis for a project-level EIR/EIS. The assessment program would include field reconnaissance to identify exposed paleontological resources and more precisely determine potential paleontologic sensitivity for the project. A paleontological resources treatment plan would be prepared by a qualified paleontologist. The plan would be included in project approval and would address the treatment of paleontological resources discovered prior to and during construction.

Further consultation would also occur at the project level with the NAHC as necessary and with Native American groups when traditional territories may be close to project-level APEs for the project. Additionally, more specific information related to traditional cultural sites of concern would be obtained as necessary.